COMPACT DISC PLAYER

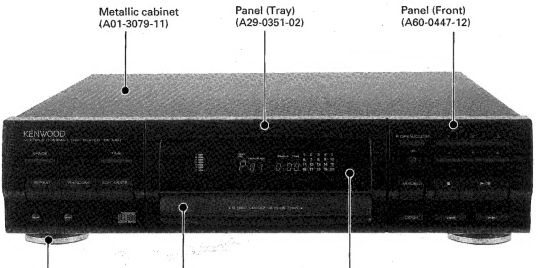
DP-M87

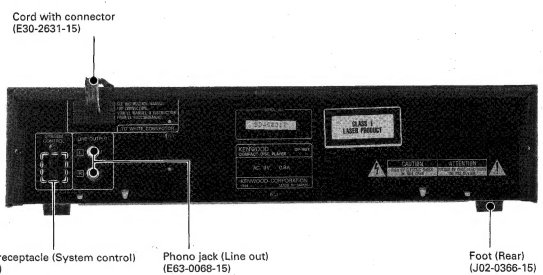
SERVICE MANUAL

ADDITIONAL

KENWOOD

B51-4867-00(O) 626





This service manual is available of changing information from serial No. 31240001.
Refer to DP-MA5/MA9 service manual (B51-4588-00), if need description in detail.

CAUTION : When doing repair of DP-M87 be sure to have the customer bring the A-57, A-77, A-87, A-97 or use power supply jig RM-90PS, or supply to 9V AC to terminal Nos 1 and 2 of WH4 on the X25-5350 (X25-5440) PC board ass'y. If not get 9V AC, please order the A-848's power transformer (parts No. L07-0038-05 / 120V / 220V / 240V). Refer to the DP-911 service manual. Don't use the "RHEOSTAT".

In compliance with Federal Regulations, following are reproductions of labels on, or inside the product relating to laser product safety.

KENWOOD-Corp. certifies this equipment conforms to DHHS Regulations No. 21 CFR 1040. 10, Chapter 1, Subchapter J.

DANGER : Laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.

DP-M87

CONTENTS/ACCESSORIES

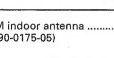
CONTENTS

ACCESSORIES 2
CIRCUIT DESCRIPTION
1. Test mode 3
2. Microprocessor : SC75217GF-642 (IC6) 5
3. Servo IC : CXA1782BQ (IC1) 7
4. Digital Signal Processor : CXD2517Q (IC2) 9
ADJUSTMENT 11
PC BOARD (COMPONENT SIDE VIEW) 13
SCHEMATIC DIAGRAM 15
EXPLODED VIEW
MECHANISM 19
UNIT 23
PARTS LIST 25
SPECIFICATIONS ..... BACK COVER

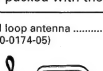
NOTE : Refer to DP-MA5/MA9 service manual (B51-4588-00), if need description in detail.

ACCESSORIES Magazine is packed with the CD player.

- FM indoor antenna 1 (T90-0175-05)



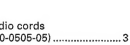
- AM loop antenna 1 (T90-0174-05)



- Antenna adaptor ..... 1 (T90-0185-05) : 75Ω / 300Ω T,E type only

- Loop antenna stand 1 (J19-2815-04)

- Audio cords (E30-0505-05) 3 (E30-0615-05) 1



- System control cords (E30-2627-05) 1 (E30-2628-05) 1

- AC plug adaptor ..... 1 (E03-0115-05) : M type only

For the unit with a European AC plug in areas other than Europe.

- Magazine 1 (J19-3394-13)

- Battery (AAA/R03) ..... 2 (–)

- Remote control unit 1
  (X94-1011-41 : RC-77M) K-77M / 88M, MIDI M-57M / M-77M
  (X94-1050-11 : RC-97M) K-99M, MIDI M-97M

Battery cover (A09-0126-03) K-77M / 88M, MIDI M-57M / M-77M
Battery cover (F07-0721-23) K-99M, MIDI M-97M

For M,X type

System name	Amp	Tuner	Cassette deck	CD player	Graphic equalizer (option)	Speaker
K-77M	A-57	T-76	X-57	DP-M87	GE-560	S-6M
K-88M	A-77	T-76	X-87	DP-M87	GE-760	S-8M
K-99M	A-87	T-76	X-87	DP-M87	GE-970	S-10M

For E,T type

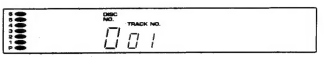
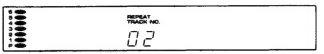
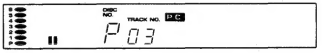
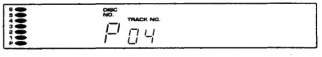
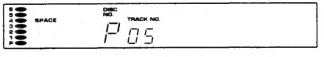
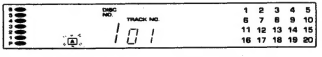
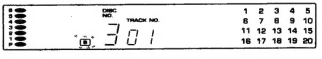
System name	Amp	Tuner	Cassette deck	CD player	Graphic equalizer (option)	Speaker
MIDI M-57M	A-57	T-76L	X-57	DP-M87	GE-560	LS-56
MIDI M-77M	A-77	T-76L	X-87	DP-M87	GE-760	LS-76
MIDI M-97M	A-97	T-76L	X-87	DP-M87	GE-970	LS-97

CIRCUIT DESCRIPTION

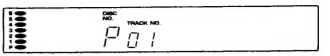
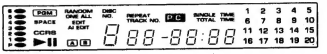
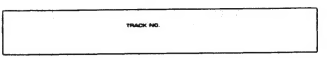
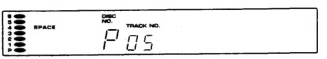
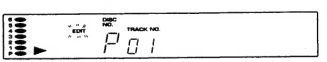
1. Test Mode

Setting the test mode

This microprocessor built in this unit (X32-) can be put to TEST MODE by just short-circuiting the test pins (#2 and #3).

No.	Input key	Function	Display
1	STOP	(1) Focusing servo ..... OFF (2) Tracking servo ..... OFF (3) Feed servo ..... OFF	
2	REPEAT	(1) Laser (In STOP mode only) ..... ON	
3	RANDOM	(1) Focusing servo ..... ON (2) Tracking servo ..... OFF (3) Feed servo ..... OFF	
4	TIME	(1) Focusing servo ..... ON (2) Tracking servo ..... ON (3) Feed servo ..... OFF	
5	PLAY	(1) Focusing servo ..... ON (2) Tracking servo ..... ON (3) Feed servo ..... ON	
6	DISC 1	Load No.1 disc to No.6 in order.	
7	DISC 2	Read the TOC (table of contents) of disc No.3 to No.6 in order. TEST mode is cancelled after reading the TOC of No.6 disc, and then playback the 1st track.	

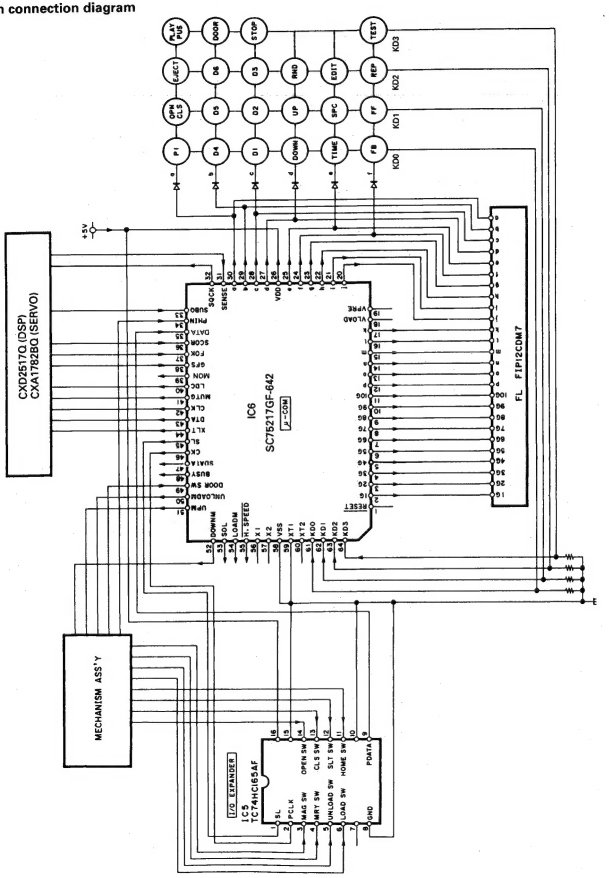
CIRCUIT DESCRIPTION

No.	Input key	Function	Display
8	DISC 3 – 6 DISC P	Load the decided No. disc which is pressed by the key and set to STOP mode. ex. Disc No.4 key is pressed (PLAY, CHECK and CLEAR keys are available to operate).	
9	UP	Turns all FL display lamps ON.	
10	DOWN	Turns all FL display lamps OFF. "DISC" and "1 ~ 6" are not off because circuit is static operation.	
11	EDIT	(1) Door opens. (2) P1 tray come out. Press "EDIT" key, "PLAY MODE".	
12	FF	In the STOP mode, moves the pickup slightly toward the outer position of disc.	
13	FB	In the STOP mode, moves the pickup slightly toward the inner position of disc.	
14	SPACE	High-speed playback CHECK mode (in stop mode only) playback P1 disc in high-speed mode. If press "SPACE" key, change to normal mode. In this mode, all keys are available.	

CIRCUIT DESCRIPTION

2. Microprocessor : SC75217GF-642 (IC6)

2-1. Pin connection diagram



CIRCUIT DESCRIPTION

2-2. Pin functions : SC75217GF-642 (IC6)

Pin No.	Pin name	I/O	Function
1	RESET	–	Reset input port
2 ~ 11	1G ~ 10G	O	FL grid control port
12 ~ 17	p ~ k	O	Not used
18	VLOAD	I	FL driver negative power supply
19	VPRE	I	FL pre-driver power supply
20 ~ 25	j ~ e	O	FL grid control port also used for key-scan
26	VDD	–	+5V power supply
27 ~ 30	d ~ a	O	FL grid control port also used for key-scan
31	SENSE	I	Signal detection port for SENSE signal from signal processor and servo IC
32	SQCK	O	Q-data read clock output port
33	SUBQ	O	Q-data input port
34	PHIN	I	Photo interrupter input port for mechanism (PH1)
35	DATA	I	Data input from TC74HC165AF
36	SCOR	I	Sub-code frame sync detection signal input port
37	FOK	I	Input port of FOK signal from RF amp
38	GFS	I	Input port of frame sync signal
39	MON	O	ON/OFF control output of disc motor
40	LDC	O	Laser ON/OFF signal output
41	MUTG	O	Mute port of signal processor
42	CLK	O	Signal processor and servo IC control out port (CLOCK)
43	DATA	O	Signal processor and servo IC control out port (DATA)
44	XLT	I	Signal processor and servo IC control out port (LATCH)
45	S/L	I	Latch output port of TC74HC165AF
46	CK	O	Clock output port of TC74HC165AF
47	SDATA	I/O	Serial DATA in/out port
48	BUSY	I/O	Serial BUSY in/out port
49	DOORSW	O	Door switch input port of mechanism
50	UNLOADM	O	Control port of unloading motor for mechanism
51	UPM	O	Control port of up motor for mechanism
52	DOWNM	O	Control port of down motor for mechanism
53	SOL	O	Control port of solenoid for mechanism
54	LOADM	O	Control port of loading motor for mechanism (L.M.)
55	H.SPEED	O	High-speed control port (Active L)
56	X1	I	Oscillation input port (4.19MHz)
57	X2	–	NC
58	Vss	–	GND
59	XT1	–	GND
60	XT2	–	NC (Open)
61 ~ 64	KD0 ~ 3	I	Key input port

2-3. Pin functions : TC74HC165AP (IC3)

Pin No.	Pin name	I/O	Function
1	SL	I	Shif load input
2	PCLK	I	Clock input
3	MAGSW	I	Magazine switch (SW4)
4	MRYSW	I	Memory switch (SW3)
5	UNLOADSW	I	Unload switch (SW5)
6	LOADSW	I	Load switch (SW5)
7	–	O	No use
8	GND	–	Ground
9	PDATA	O	Data output
10	–	I	No use
11	HOMESW	I	Home position switch (SW2)
12	SLTSW	I	Start limit switch (SW1)
13	CLSSW	I	Tray close switch (SW6)
14	OPNSW	I	Tray open switch (SW6)
15	–	I	No use
16	Vcc	–	Power supply (+5V)

2-4. TOC data output of serial codes for AI file

When the CD player reads the TOC data of a disc (in the play mode), the following serial codes (16 bits) are output.

- **CD MAX TRACK No. [61XX]**
  Model code 61H
  Function code .....XXH (Max TNO)
- **CD TOTAL TIME (min.) [62XX]**
  Model code 62H
  Function code .....XXH (Total time in min.)
- **CD TOTAL TIME (sec.) [62XX]**
  Model code 63H
  Function code .....XXH (Total time in sec.)

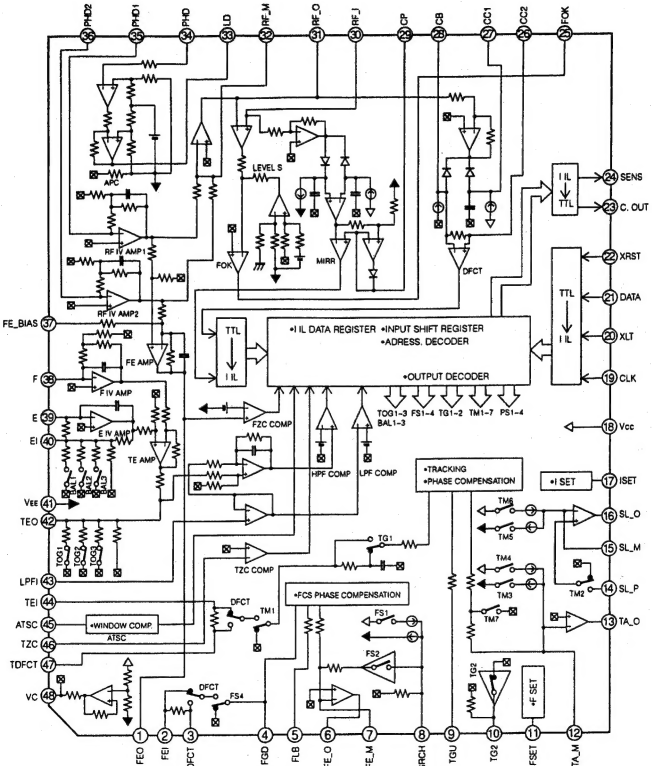
Example

When a disc containing 20 tunes of 65 minutes and 2 seconds in total is played, the following three codes [6120], [6265] and [6302] are output continuously.

CIRCUIT DESCRIPTION

3. Servo IC : CXA1782BQ (IC1)

3-1. Block diagram



CIRCUIT DESCRIPTION

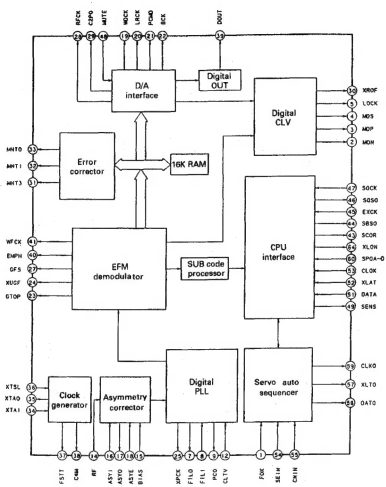
3-2. Pin function

No.	Pin name	I/O	Function
1	FEO	I	Focus error amplifier output. Connected internally to FZC comparator input.
2	FEI	I	Focus error input.
3	FDFCT	I	Capacitor connection pin for detect time constant.
4	FGD	I	Ground this pin through a capacitor when decreasing the focus servo high-frequency gain.
5	FLB	I	External time constant setting pin for increasing the focus servo low-frequency.
6	FE-O	O	Focus drive output.
7	FL-M	I	Focus amplifier negative input pin.
8	SRCH	I	External time constant setting pin for generating focus servo waveform.
9, 10	TGU, TG2	I	External time constant setting pin for switching tracking high-frequeny gain.
11	TSET	I	High cut off frequency setting pin for focus and tracking phase compensation amplifier.
12	TA-M	I	Tracking amplifier negative input pin.
13	TA-O	O	Tracking drive output.
14	SL-P	I	Feed amplifier non-inversed input.
15	SL-M	I	Feed amplifier negative input pin.
16	SL-O	O	Feed drive output.
17	ISET	I	Setting pin for focus search, track jump, and feed kick current.
18	Vcc	–	
19	CLK	I	Serial data transfer clock input from CPU (no pull up resistance).
20	XLT	I	Latch input from CPU (no pull up resistance).
21	DATA	I	Serial data input from CPU (no pull up resistance).
22	XRST	I	Reset input; resets at low (no pull up resistance).
23	C.OUT	O	Track number count signal output.
24	SENS	O	Outputs FZC, DFCT, TZC gain, balance and others according to the command from CPU.
25	FOK	O	Focus OK comparator output (DC voltage : 10kΩ load resistance is connected).
26	CC2	O	Input pin for the DEFECT bottom hold output capacitance-coupled.
27	CC1	I	DEFECT bottom hold output.
28	CB	I	Connection pin for DEFECT bottom hold capacitor.
29	CP	I	Connection pin for MIRR hold capacitor. MIRR comparator non-inversed input.
30	RF-I	I	Input pin for the RF summing amplifier output capacitance-coupled.
31	RF-O	O	RF summing amplifier output. Eye pattern check point.
32	RF-M	I	RF summing amplifier inversed input. The RF amplifier gain is determined by the resistance connected between this pin and RFO pin.
33	LD	O	APC amplifier output.
34	PHD	I	APC amplifier input.
35, 36	PHD1, PHD2	I	RF I-V amplifier inversed input. Connect these pins to the photo diode A+C and B+D pins.
37	FE-BIAS	I	Bias adjustment of focus error amplifier.
38, 39	F, E	I	F I-V and E I-V amplifier inversed input. Connect these pins to photo diodes F and E.
40	EI	–	I-V amplifier E gain adjustment (when not using automatic balance adjustment).
41	VEE	–	
42	TEO	O	Tracking error amplifier output. E-F signal is output.
43	LPFI	I	Comparator input for balance adjustment (input from TEO through L.P.F.).
44	TEI	I	Tracking error input.
45	ATSC	I	Window comparator input for ATSC detection.
46	TZC	I	Tracking zero-cross comparator input.
47	TDFCT	I	Capaitor connection pin for defect time constant.
48	VC	O	(Vcc+VEE) / 2 DC voltage output.

CIRCUIT DESCRIPTION

4. Digital Signal Processor : CXD2517Q (IC2)

4-1. Block diagram



4-2. Pin function

No.	Pin name	I/O		Function
1	FOK	I		Focus OK input. Used for SENS output and the servo auto sequencer.
2	MON	I	1, 0	Disc motor ON/OFF control output.
3, 4	MDP, MDS	O	1, Z, 0	Disc motor servo clock.
5	LOCK	O	1, 0	GFS is sampled at 460Hz; when GFS is high, this pin outputs a high signal. If GFS is low eight consecutive samples, this pin outputs low.
6	TEST	I		Test pin (normally GND).
7	FILO	O	Analog	Master PLL (slave=digital PLL) filter output.
8	FILI	I		Master PLL filter input.
9	PCO	O	1, Z, 0	Master PLL charge pump output.
10	V_{SS}	–	–	GND
11	AV_{SS}	–	–	GND (analog)
12	CLTV	I		Master VCO control voltage input.
13	AV_{DD}	–	–	Analog power supply (+5V).
14	RF	I		EFM signal input.
15	BIAS	I		Constant current input of asymmetry circuit.

CIRCUIT DESCRIPTION

No.	Pin name	I/O		Function
16	ASYI	I		Asymmetry comparator volatge input.
17	ASYO	O	1, 0	EFM full-swing output (low=Vss, high=VDD).
18	ASYE	I		Low : asymmetrycircuitoff, high : asymmetry circuit on.
19	WDCK	O	1, 0	D/A interface. Word clock f=2Fs.
20	LRCK	O	1, 0	D/A interface. LR clock f=Fs.
21	PCMD	O	1, 0	D/A interface. Serial data (two's complement, MSB first).
22	BCK	O	1, 0	D/A interface. Bit clock.
23	GTOP	O	1, 0	GTOP output.
24	XUGF	O	1, 0	XUGF output.
25	XPCK	O	1, 0	XPLCK output.
26	VDD	–	–	Power supply (+5V).
27	GFS	O	1, 0	GFS output.
28	RFCK	O	1, 0	RFCK output.
29	C2PO	O	1, 0	C2PO output.
30	XROF	O	1, 0	XRAOF output.
31 ~ 33	MNT3, 1, 0	O	1, 0	MNT 3, MNT 1, MNT 0 output.
34	XTAI	I		16.9344MHz crystal oscillation circuit input, or 33.8688MHz input.
35	XTAO	O	1, 0	16.9344MHz crystal oscillation circuit output.
36	XTSL	I		Crystal selection input. Set low when the crystal is 16.9344MHz, high when 33.8688MHz.
37	FSTT	O	1, 0	2/3 frequency divider output for pins 34 and 35.
38	C4M	O	1, 0	4.2336MHz output.
39	DOUT	O	1, 0	Digital-out output.
40	EMPH	O	1, 0	Outputs high signal when the playback disc has emphasis, low signal when no emphasis.
41	WFCK	O	1, 0	WFCK output.
42	Vss	–	–	GND
43	SCOR	O	1, 0	Outputs high signal when either sub code sync S0 or S1 is detected.
44	SBSO	O	1, 0	Sub P to W serial output.
45	EXCK	I		SBSO read-out clock input.
46	SQSO	O	1, 0	Sub Q 80-bit serial output.
47	SQCK	I		SQSO read-out clock input.
48	MUTE	I		High : mute, low : release
49	SENS	O	1, 0	SENS output to CPU.
50	XRST	I		System reset. Reset when low.
51	DATA	I		Serial data input from CPU.
52	XLAT	I		Latch input from CPU. Serial data is latched the falling edge.
53	CLOK	I		Serial data transfer clock input from CPU.
54	SEIN	I		Sense input from SSP.
55	CNIN	I		Track jump count signal input.
56	DATO	O	1, 0	Serial data output to SSP.
57	XLTO	O	1, 0	Serial data latch output to SSP. Latched at the falling edge.
58	VDD	–	–	Power supply (+5V).
59	CLKO	O	1, 0	Serial data transfer clock output to SSP.
60 ~ 63	SPOA ~ SPOD	I		µ-com extended interface (input A ~ D).
64	XLON	O	1, 0	µ-com extended interface (output).

Notes
- PCMD is two's complement output of MSB first.
- GTOP is used to monitor the frame sync protection status.
- XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
- XPLCK is the inverse of EFM PLL clock. The PLL is designed so that the falling edge and the EFM signal transition point coincide.
- GFS goes high when the frame sync and the insertion protection timing match.
- RFCK is derived from the crystal accuracy. This signal has cycle of 136µ.
- C2PO represents the data error status.
- XRAOF is generated when the 16K RAM exceeds the ±4F jitter margin.

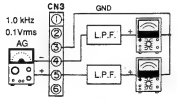
ADJUSTMENT

No.	ITEM	INPUT SETTING	OUTPUT SETTING	PLAYER SETTING	ALIGNMENT POINT	ALIGN FOR	FIG.
1	TRACKING ERROR BALANCE	Test disc Type 4	Connect an oscilloscope as follows. CH1: RF (CN3-6) CH2: TE (CN3-1)	Press the P. OPEN/CLOSE key to open the tray. Reset to TEST mode. Then, press the CHECK key. Confirm that the display is "03".	TE BALANCE VR2	Symmetry between upper and lower patterns, or DC=0±0.05V	(a)
2	FOCUS ERROR BALANCE	Test disc Type 4	Connect an oscilloscope as follows. CH1: RF (CN3-6) CH2: TE (CN3-1)	Press the PLAY key. Confirm that the display is "05".	FE BALANCE VR1	Optimum eyepattern Grating is correctly a ligned with the RF level of 1.5Vp-p or more and the TE (servo open) level of 1.5Vp-p or more, the pickup is acceptable.	(b)
3	FOCUS GAIN	Test disc Type 4 Apply signal of 1kHz, 0.1Vrms to CN3 pin 4 and 5.	Connect a LPF to CN3 pin 4-5, to which connect an oscilloscope or two AC voltmeters.	Press the PLAY key. Confirm that the display is "05".	FOCUS GAIN VR3	Two VTVMs should read the same value.	(c)
4	TRACKING GAIN	Test disc Type 4 Apply signal of 1.3kHz, 0.1Vrms to CN3 pin 1 and 2.	Connect a LPF to CN3 pin 1-2, to which connect an oscilloscope or two AC voltmeters. or two AC voltmeters.	Press the PLAY key. Confirm that the display is "05".	TRACKING GAIN VR4	Two VTVMs should read the same value.	(c)

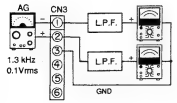
(NOTE) Type 4 disc : SONY YEDS-18 TEST DISC or equivalent.
LPF: around 47kohms+390pF or so.
Adjustment procedures are in TEST MODE.

(c)Focus Gain and Tracking Gain Adj.

Focus gain adj.

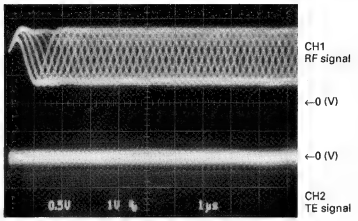


Tracking gain adj.



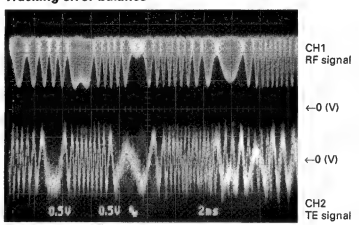
ADJUSTMENT

RF level Wave-form



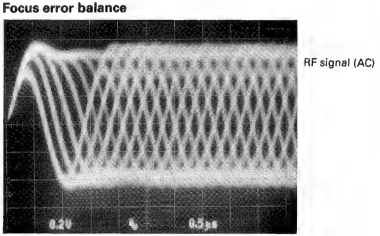
- RF signal and E.Spot signal in test mode (PLAY).

Tracking error balance



- RF signal and T.Error signal; in test mode (Focusing ON). (Disc type 4)
- Adjust T.Error so that the waveform is symmetrical above and below 0V (VR2).

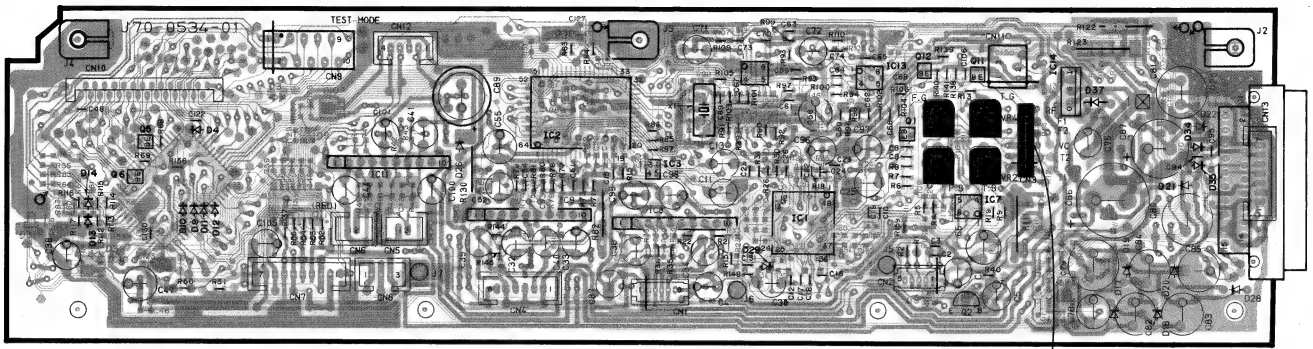
Focus error balance



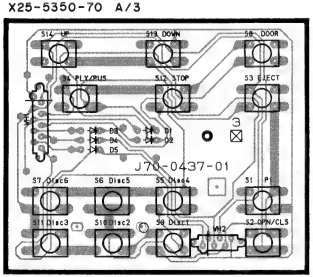
- RF signal in test mode (PLAY).
- Perform the tangential and focusing offset adjustments so that each of the center cross points are focused into one point on the display. The crossing points above and below the center shall also be displayed clearly.

PC BOARD (COMPONENT SIDE VIEW)

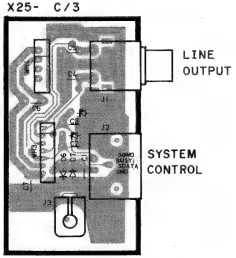
X32-2670-71



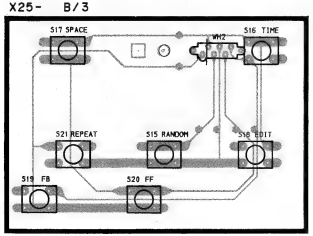
X25-5350-70 A/3



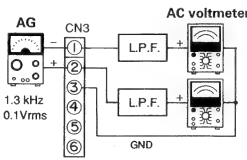
X25- C/3



X25- B/3

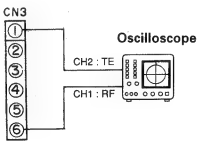


(c) Tracking gain : Two VTVMs should read the same value.

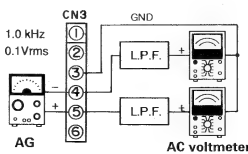


(a) Tracking error balance :
Symmetry between upper and lower patterns or DC=0±0.05V.

(b) Focus error balance : Optimum eye pattern.



(c) Focus gain : Two VTVMs should read the same value.



Refer to the schematic diagram for the values of resistors and capacitors.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❺

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
19	1B		D10-3262-04	SLIDER(D⊘⊘R)		
20	1C		D10-3263-03	SLIDER(L⊘ADING)		
21	1C		D10-3264-04	SLIDER		
22	1B		D10-3265-04	ARM		
23	1A		D10-3266-03	ARM(D⊘⊘R)		
24	2D		D10-3267-03	ARM(L⊘ADING)		
25	2C		D10-3268-13	SLIDER		
26	1C,2D		D10-3269-04	ARM ASSY		
27	1D,2D		D10-3271-04	ARM ASSY		
32	1D		D10-3273-03	ARM		
33	3C		D10-3274-04	ARM		
34	2A		D10-3275-04	SLIDER(EJECT)		
35	2A		D10-3276-03	ARM(L⊘CK)		
36	1A		D10-3278-04	ARM ASSY		
37	3A		D10-3281-03	SLIDER		
38	1C		D10-3294-14	R⊘D(PICKUP)		
43	3B		D13-0983-04	GEAR		
44	2B		D13-0984-04	GEAR		
45	2B		D13-0985-04	GEAR		
46	2B		D13-0986-04	GEAR(PLANET)		
47	2B,2C		D13-0987-04	GEAR(CARRIER)		
48	2C		D13-0989-04	GEAR(INTERMEDIATE)		
49	2C		D13-0990-04	GEAR(FINAL)		
50	1B		D13-0991-04	GEAR(W⊘RM)		
51	1B		D13-0992-04	GEAR		
52	1B		D13-0993-04	GEAR		
53	1B		D13-0994-04	GEAR		
54	2B		D13-0995-04	GEAR(ARM)		
55	3B		D13-0996-04	GEAR		
56	3B		D13-1502-04	W⊘RM		
57	3A		D21-1633-05	SHAFT		
60	3B		E35-0388-05	WIRING HARNESS(LEVER SWITCH)		
61	3A		E35-0390-05	WIRING HARNESS(L⊘ADING M⊘T⊘R)		
62	2B,2C		E35-0391-05	WIRING HARNESS(FEED,DISC M⊘T⊘R		
63	1B		E35-0392-05	WIRING HARNESS(VERTICAL M⊘T⊘R)		
64	2C		E35-0417-05	WIRING HARNESS(SP)		
65	2C		E35-0418-05	WIRING HARNESS(6P)		
66	1A		E35-0435-08	WIRING HARNESS(SWITCH)		
70	3A		G01-3617-04	EXTENSI⊘N SPRING		
69	1A,1B		G11-2134-08	CUSHI⊘N		
71	1A		G01-3470-08	T⊘RSI⊘N C⊘IL SPRING		
72	1A		G01-3471-08	EXTENSI⊘N SPRING(L⊘CK)		
73	2B		G01-3472-04	EXTENSI⊘N SPRING		
74	2C		G01-3473-04	C⊘MPRESSI⊘N SPRING		
75	1C		G01-3474-04	EXTENSI⊘N SPRING		
76	2C		G01-3475-04	EXTENSI⊘N SPRING		
77	2A		G01-3476-04	EXTENSI⊘N SPRING		
78	1A		G01-3477-04	EXTENSI⊘N SPRING(ARM L⊘CK)		
79	1B		G01-3480-04	EXTENSI⊘N SPRING		
80	1A		G01-3481-08	EXTENSI⊘N SPRING		
81	2C		G01-3485-04	C⊘MPRESSI⊘N SPRING		
82	2C		G01-3518-04	C⊘MPRESSI⊘N SPRING		
83	2B		G02-1002-04	FLAT SPRING		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX (Far East, Hawaii) T: England E: Europe G: Germany
Y: AAFES (Europe) X: Australia M: Other Areas

⚠ indicates safety critical components.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❻

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
84	1B,3C		G10-0146-04	N⊘N-W⊘VEN FABRIC		
85	1A,1D		G11-0129-04	S⊘FT TAPE (20X7X3)		
86	2C		J02-1058-15	INSULAT⊘R		
87	2D		J11-0181-03	CLAMPER		
88	3A		J19-3485-22	H⊘LDER ASSY		
89	3A		J19-3486-11	H⊘LDER		
90	2B		J19-3487-02	H⊘LDER(MAGAZINE)		
91	2A		J19-3489-12	H⊘LDER		
92	1B		J21-5922-04	M⊘UNTING HARDWARE		
93	1C		J90-0685-03	GUIDE		
94	2C		J90-0686-24	RAIL ASSY		
95	3D		J90-0688-13	RAIL		
96	3A		J99-0517-02	TRAY		
F			N89-2608-46	BINDING HEAD TAPTITE SCREW		
J			N09-2769-05	MACHINE SCREW		
K			N09-2817-05	TAPTITE SCREW (2.6X10,12P)		
L			N09-2913-05	MACHINE SCREW		
M			N09-2914-05	MACHINE SCREW		
N			N19-0366-04	FLAT WASHER		
⊘			N19-0891-04	FLAT WASHER		
P			N19-1105-04	FLAT WASHER		
Q			N19-1318-04	FLAT WASHER		
R			N38-2625-46	PAN HEAD MACHIN SCREW		
S			N39-2025-46	PAN HEAD MACHIN SCREW		
T			N83-2008-46	PAN HEAD TAPTITE SCREW		
U			N89-2608-46	BINDING HEAD TAPTITE SCREW		
V			N89-2006-46	BINDING HEAD TAPTITE SCREW		
W			N89-2606-45	BINDING HEAD TAPTITE SCREW		
X			N89-2606-46	BINDING HEAD TAPTITE SCREW		
SW1	2C		S33-1022-05	LEVER SWITCH(PICKUP LIMIT)		
SW6	1A		S33-1022-05	LEVER SWITCH(⊘PEN/CL⊘SE)		
SW7	3B		S33-2061-05	LEVER SWITCH(D⊘⊘R)		
97	2B		T42-0597-05	DC M⊘T⊘R(FEED M⊘T⊘R)		
98	2D		T50-1055-04	Y⊘KE		
99	2D		T99-0503-15	MAGNET		
DM	2C		A11-0791-03	SUB CHASSIS ASSY(DISC M⊘T⊘R)		
FM	1B		T42-0612-04	M⊘T⊘R ASSY(FEED M⊘T⊘R)		
LM	3A		T42-0620-05	DC M⊘T⊘R(L⊘ADING M⊘T⊘R)		
PU	1C		T25-0023-05	⊘PTICAL PICKUP HEAD(HPC-2S)		
VM	1C		T42-0567-05	DC M⊘T⊘R(VERTICAL M⊘T⊘R)		
S⊘L1	1A		T94-0227-18	MAGNETIC PLUNGER(D⊘⊘R)		
MECHANISM ASS'Y SINGAPORE MADE (X92-1839-51)						
101	3G		A10-3025-02	CHASSIS ASSY		
102	3H		A11-0784-02	SUB CHASSIS(RIGHT)		S⊘S
103	1G		A11-0785-01	SUB CHASSIS(LEFT)		S⊘S
104	1F		A11-0786-04	SUB CHASSIS CALKING ASSY		S⊘S
105	1H		A11-0750-02	SUB CHASSIS(L⊘ADING)		S⊘S
106	2H		A11-0752-02	SUB CHASSIS(L⊘ADING)		
107	1E		A11-0781-03	SUB CHASSIS		S⊘S
108	3F		A11-0782-04	SUB CHASSIS CALKING ASSY		S⊘S
109	1E		A11-0765-04	SUB CHASSIS CALKING ASSY		S⊘S
114	3E		D10-3105-13	SLIDER		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX (Far East, Hawaii) T: England E: Europe G: Germany
Y: AAFES (Europe) X: Australia M: Other Areas

S=SINGAPORE made

⚠ indicates safety critical components

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❼

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
115	2F		D10-3257-03	SLIDER		
116	1E		D10-3258-03	ARM(L⊘CK)		
117	2F		D10-3339-03	ARM(L⊘ADING)		S
118	1F		D10-3340-02	SLIDER(LIFT)		S
119	1F		D10-3262-04	SLIDER(D⊘⊘R)		
120	1G		D10-3341-03	SLIDER(L⊘ADING)		S
121	1G		D10-3264-04	SLIDER		
122	1F		D10-3342-03	ARM		S
123	1E		D10-3266-03	ARM(D⊘⊘R)		
124	2H		D10-3267-03	ARM(L⊘ADING)		
125	2G		D10-3268-13	SLIDER		
126	1G,1H		D10-3269-04	ARM ASSY		
127	1H,2H		D10-3271-04	ARM ASSY		
132	1H		D10-3273-03	ARM		
133	3G		D10-3274-04	ARM		
134	2E		D10-3275-04	SLIDER(EJECT)		
135	2E		D10-3347-02	ARM(L⊘CK)		S
136	1E		D10-3278-04	ARM ASSY		
137	3E		D10-3281-03	SLIDER		
138	1G		D10-3294-14	R⊘D(PICKUP)		
143	3F		D13-0983-04	GEAR		
144	2F		D13-0984-04	GEAR		
145	2F		D13-0985-04	GEAR		
146	2F		D13-0986-04	GEAR(PLANET)		
147	2F,2G		D13-0987-04	GEAR(CARRIER)		
148	2G		D13-0989-04	GEAR(INTERMEDIATE)		
149	2G		D13-0990-04	GEAR(FINAL)		
150	2F		D13-0991-04	GEAR(W⊘RM)		
151	2F		D13-0992-04	GEAR		
152	1F		D13-0993-04	GEAR		
153	1F		D13-0994-04	GEAR		
154	2F		D13-0995-04	GEAR(ARM)		
155	3F		D13-0996-04	GEAR		
156	3F		D13-1502-04	W⊘RM		
157	3E		D21-1633-05	SHAFT		
160	3F		E35-0388-05	WIRING HARNESS(LEVER SWITCH)		
161	3E		E35-0390-05	WIRING HARNESS(L⊘ADING M⊘T⊘R)		
162	2F,2G		E35-0391-05	WIRING HARNESS(FEED,DISC M⊘T⊘R		
163	1F		E35-0392-05	WIRING HARNESS(VERTICAL M⊘T⊘R)		
164	2G		E35-0417-05	WIRING HARNESS(SP)		
165	2G		E35-0418-05	WIRING HARNESS(6P)		
166	1E		E35-0435-08	WIRING HARNESS(SWITCH)		
169	1E,1F		G11-2134-08	CUSHI⊘N		
170	3E		G01-3167-04	EXTENSI⊘N SPRING		
171	1E		G01-3470-08	T⊘RSI⊘N C⊘IL SPRING		
172	1E		G01-3471-08	EXTENSI⊘N SPRING(L⊘CK)		
173	2F		G01-3472-04	EXTENSI⊘N SPRING		
174	2G		G01-3473-04	C⊘MPRESSI⊘N SPRING		
175	1G		G01-3474-04	EXTENSI⊘N SPRING		
176	2G		G01-3475-04	EXTENSI⊘N SPRING		
177	2E		G01-3476-04	EXTENSI⊘N SPRING		
178	1E		G01-3477-04	EXTENSI⊘N SPRING(ARM L⊘CK)		
179	1F		G01-3480-04	EXTENSI⊘N SPRING		
180	1E		G01-3481-08	EXTENSI⊘N SPRING		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX (Far East, Hawaii) T: England E: Europe G: Germany
Y: AAFES (Europe) X: Australia M: Other Areas

S=SINGAPORE made

⚠ indicates safety critical components.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❽

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
181	2G		G01-3485-04	C⊘MPRESSI⊘N SPRING		
182	2G		G01-3518-04	C⊘MPRESSI⊘N SPRING		
183	2F		G02-1010-04	FLAT SPRING		
184	1F,3G		G10-0146-04	N⊘N-W⊘VEN FABRIC		
185	1E,1H		G11-0129-04	S⊘FT TAPE (20X7X3)		
-			G10-0192-04	N⊘N-W⊘VEN FABRIC(10X20)		
186	2G		J02-1058-15	INSULAT⊘R		
187	2H		J11-0181-03	CLAMPER		
188	3E		J19-3564-22	H⊘LDER ASSY		S⊘S
189	3E		J19-3566-11	H⊘LDER		S⊘S
190	2F		J19-3567-02	H⊘LDER(MAGAZINE)		S⊘S
191	2E		J19-3568-12	H⊘LDER		S⊘S
192	1F		J21-5979-04	M⊘UNTING HARDWARE		S⊘S
193	1G		J90-0696-03	GUIDE		S⊘S
194	2G		J90-0697-14	RAIL ASSY		S⊘S
195	3H		J95-0699-02	RAIL		S⊘S
196	3H		J99-0517-02	TRAY		
-		※	J21-6077-04	M⊘UNTING HARDWARE		
F			N89-2608-46	BINDING HEAD TAPTITE SCREW		
J			N09-2769-05	MACHINE SCREW		
K			N09-2817-05	TAPTITE SCREW (2.6X10,12P)		
L			N09-2913-05	MACHINE SCREW		
M			N09-2914-05	MACHINE SCREW		
N			N19-0366-04	FLAT WASHER		
⊘			N19-0891-04	FLAT WASHER		
P			N19-1105-04	FLAT WASHER		
Q			N19-1318-04	FLAT WASHER		
R			N38-2625-46	PAN HEAD MACHIN SCREW		
S			N39-2025-46	PAN HEAD MACHIN SCREW		
T			N83-2008-46	PAN HEAD TAPTITE SCREW		
U			N86-2008-46	BINDING HEAD TAPTITE SCREW		
V			N89-2006-46	BINDING HEAD TAPTITE SCREW		
W			N89-2606-45	BINDING HEAD TAPTITE SCREW		
X			N89-2606-46	BINDING HEAD TAPTITE SCREW		
SW1	2G		S33-1022-05	LEVER SWITCH(PICKUP LIMIT)		
SW6	1E		S33-1022-05	LEVER SWITCH(⊘PEN/CL⊘SE)		
SW7	3F		S33-2061-05	LEVER SWITCH(D⊘⊘R)		
197	2F		T42-0597-05	DC M⊘T⊘R(FEED M⊘T⊘R)		
198	2H		T50-1055-04	Y⊘KE		
199	2H		T99-0503-15	MAGNET		
DM	2G		A11-0791-03	SUB CHASSIS ASSY(DISC M⊘T⊘R)		
FM	1F		T42-0612-04	M⊘T⊘R ASSY(FEED M⊘T⊘R)		
LM	3E		T42-0620-05	DC M⊘T⊘R(L⊘ADING M⊘T⊘R)		
PU	1G		T25-0023-05	⊘PTICAL PICKUP HEAD(HPC-2S)		
VM	1F		T42-0567-05	DC M⊘T⊘R(VERTICAL M⊘T⊘R)		
S⊘L1	1E		T94-0227-18	MAGNETIC PLUNGER(D⊘⊘R)		

L: Scandinavia K: USA P: Canada R: Mexico
Y: PX (Far East, Hawaii) T: England E: Europe G: Germany
Y: AAFES (Europe) X: Australia M: Other Areas

S=SINGAPORE made

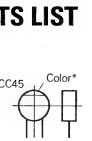
⚠ indicates safety critical components

PARTS LIST

CAPACITORS

CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
Multiplier
2nd number
1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF -10 ~ +50 Less than 4.7μF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

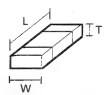
(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

DP-M87

SPECIFICATIONS

Format

System ..... Compact disc digital audio system
Laser ..... Semiconductor laser
Number of channels ..... 2 channels
Playing rotation ..... 200rpm ~ 500rpm (CLV)

D/A Convertors

D/A conversion ..... 1 Bit
Oversampling 8fs (352.8kHz)

Audio

Frequency response ..... 20Hz ~ 20kHz, ±1.0dB
Signal to noise ratio ..... More than 96dB
Dynamic range ..... More than 90dB
Total harmonic distortion ..... Less than 0.005%
Channel separation ..... More than 90dB
Wow & Flutter ..... Unmeasurable limit
Output level/impedance
Fixed ..... 1.2V / 1kΩ

General

Dimensions ..... W : 360mm
H : 90mm
D : 353mm
Weight (net) 4.1kg

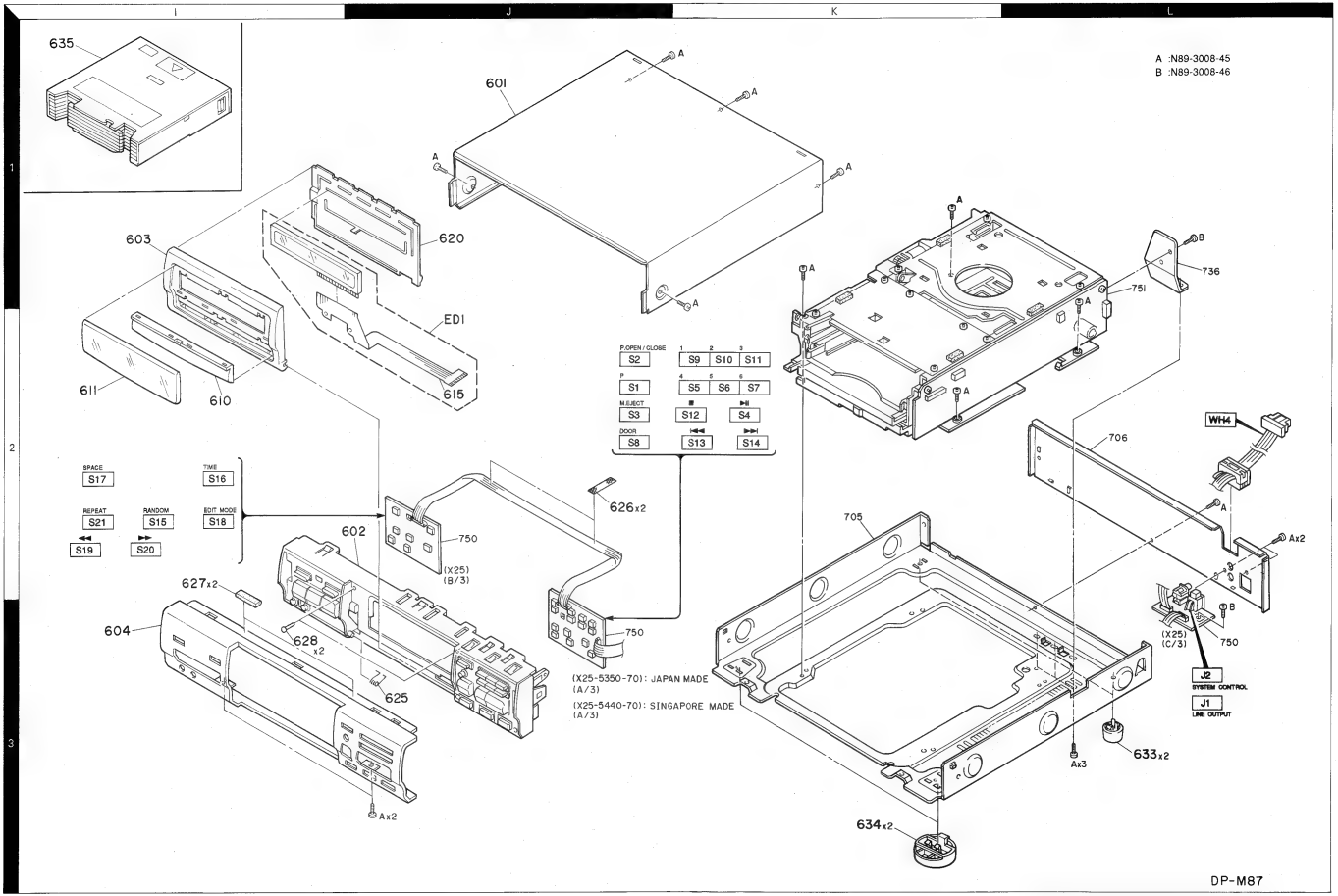
Note : KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note :
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the General Market (M) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

KENWOOD CORPORATION
Alive Mitake, 2-6, 1-chome Shibuya, Shibuya-ku, Tokyo 150, Japan
KENWOOD SERVICE CORPORATION
P.O. BOX 22745, 2201 East Dominguez St., Long Beach, CA 90810-5745, U.S.A.
KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8
KENWOOD ELECTRONICS LATIN AMERICA S.A.
P.O. BOX 55-2791, Piso 6 Plaza Chase, Cl. 47 y Aquilino de la Guardia, Panama, Republic de Panama
TRIO-KENWOOD U.K. LIMITED
KENWOOD House, Dwight Road, Watford, Herts., WD1 8EB United Kingdom
KENWOOD ELECTRONICS BENELUX N.V.
Mechelsesteenweg 418 B-1930 Zaventem, Belgium
KENWOOD ELECTRONICS DEUTSCHLAND GMBH
Rembrücker-Str. 15, 63150 Heusenstamm, Germany
TRIO-KENWOOD FRANCE S.A.
13 Boulevard Ney, 75018 Paris, France
KENWOOD ELECTRONICS ITALIA S.p.A.
Via G. Sirtori, 7/9 20129 Milano, Italy
KENWOOD ESPAÑA S.A.
Bolivia, 239-08020 Barcelona, Spain
KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)
P.O. BOX 504, 8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140, Australia
KENWOOD & LEE ELECTRONICS, LTD.
Unit 3712-3724, Level 37 Tower 1, Metroplaza, 223 Hing Fong Road, Kwai Fong N.T. Hong Kong
KENWOOD ELECTRONICS SINGAPORE PTE LTD.
No. 1 Genting Lane #07-00, KENWOOD Building, Singapore, 1334

1994-2/1994-3 (N) 2083

EXPLODED VIEW (UNIT)



Parts with the exploded numbers larger than 700 are not supplied.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❶

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Destination 仕向	Remarks 備考
			DP-M87			
601	1J	*	A01-3079-11	METALLIC CABINET		
602	2J	*	A22-1647-31	SUB PANEL		
603	1I	*	A29-0351-02	PANEL (TRAY)		
604	3I	*	A60-0447-12	PANEL (PANEL)		
610	2I	*	B07-2249-03	ESCUTCHEON		
611	2I	*	B10-1984-03	FRONT GLASS		
-			B46-0096-43	WARRANTY CARD	X	
-			B46-0310-03	WARRANTY CARD	TE	
-			B59-0179-24	CAUTION CARD		
615	2J		B35-0435-08	WIRING HARNESS		
620	1J	*	F07-0719-13	COVER		
625	3J	*	G01-3604-14	TORSION COIL SPRING		
626	2J		G10-0173-04	NON-WOVEN FABRIC		
627	2I		G11-0155-14	SHOT TAPE (40X9X2)		
628	3I		G13-0182-04	CUSHION		
-		*	H10-5545-02	POLYSTYRENE FOAMED FIXTURE		J
-		*	H10-5546-02	POLYSTYRENE FOAMED FIXTURE		J
-		*	H10-5570-02	POLYSTYRENE FOAMED FIXTURE		S
-		*	H10-5571-02	POLYSTYRENE FOAMED FIXTURE		S
-		*	H20-0564-04	PROTECTION COVER	M	
-		*	H25-0384-04	PROTECTION BAG	XE	
-		*	H25-0658-04	PROTECTION BAG	T	
-		*	H50-0717-04	ITEM CARTON CASE		J
-		*	H50-0718-04	ITEM CARTON CASE	TXE	S
-		*	H50-0841-04	ITEM CARTON CASE	M	S
633	3L		J02-0366-15	FOOT		
634	3K		J02-1040-05	FOOT		
635	1I		J19-3394-13	MAGAZINE (CDM-600)		
-			J61-0307-05	WIRE BAND		
DB1	2J		PIP12CDM7	INDICATOR TUBE		
			ELECTRIC UNIT X25-4900-00 : J, X25-5330-20 : S			
660	1B,1F		B35-0389-05	WIRING HARNESS(8P)		J
660	1B,1F		B35-0599-05	WIRING HARNESS(8P)		S
SW2	1B,1F		S64-0006-05	LEVER SWITCH(HOME POSITION)		
SW5	1B,1F		S33-2062-05	LEVER SWITCH(LOADING IN/OUT)		
SW3,4	1B,1F		S68-0025-05	PUSH SWITCH(MEMORY,MAGAZINE)		
PH1	1B,1F		T95-0123-05	OPTO ISOLATOR(LIFT POSITION)		
			DISPLAY UNIT X25-5350-70 : J, X25-5440-70 : S			
C1			CK45F1H103Z	CERAMIC 0.010UF Z		
C2 ,3			CC45FSL1H221J	CERAMIC 220PF J		
C4 ,5			CK45F1H102K	CERAMIC 1000PF K		
C6			CK45F1H103Z	CERAMIC 0.010UF Z		
C7			CK45F1H473Z	CERAMIC 0.047UF Z		
J1	3L		E63-0068-15	PHONO JACK(LINE OUT)		
J2	3L		B08-0312-05	RECTANGULAR RECEPTACLE(S.CONT)		
WH4	2L		E30-2631-15	CORD WITH CONNECTOR		
S1 -21	2I,2K		S40-1064-05	TACT SWITCH(P1,OPEN/CLOSE etc)		
D1 -7			HSS104	DIODE		

L:Scandinavia K:USA P:Canada R:Mexico J=JAPAN made, S=SINGAPORE made
Y:PX (Far East, Hawaii) T:England E:Europe G:Germany
Y:AAFES (Europe) X:Australia M:Other Areas

⚠ indicates safety critical components.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❷

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Destination 仕向	Remarks 備考
D1 -7			1SS133	DIODE		
			CONTROL UNIT X32-2760-71: J, X32-2740-71 : S			
C1			CE04KW1A470M	ELECTRO 47UF 10WV		
C2 ,3			CC73FSL1H150J	CHIP C 15PF J		
C4			CE04KW1V100M	ELECTRO 10UF 35WV		
C5			CE04KW1A470M	ELECTRO 47UF 10WV		
C6			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C8			CC73FSL1H220J	CHIP C 22PF J		
C9			CC73FSL1H180J	CHIP C 18PF J		
C10			CK73FB1H153K	CHIP C 0.015UF K		
C11			CE04KW1H R47M	ELECTRO 0.47UF 50WV		
C12			CK73FB1H333K	CHIP C 0.033UF K		
C13			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C14			CK73FB1H223K	CHIP C 0.022UF K		
C15			CC73FSL1H221J	CHIP C 220PF J		
C16			CK73FB1H222K	CHIP C 2200PF K		
C17			CK73FB1H103K	CHIP C 0.010UF K		
C18			CK73FB1H333K	CHIP C 0.033UF K		
C19			CK73FB1E47AZ	CHIP C 0.47UF Z		
C20			CK73FB1H222K	CHIP C 2200PF K		
C22 ,23			CK73FB1E104K	CHIP C 0.10UF K		
C24			CK73FB1E47AZ	CHIP C 0.47UF Z		
C25			CE04HW1E100M	NP-ELEC 10UF 25WV		
C26			CK73FB1H333K	CHIP C 0.033UF K		
C27			CC73FSL1H121J	CHIP C 120PF J		
C28			CK73FB1H103K	CHIP C 0.010UF K		
C29			CK73FB1H473K	CHIP C 0.047UF K		
C30			CE04HW1E100M	NP-ELEC 10UF 25WV		
C31			CK73FB1H103K	CHIP C 0.010UF K		
C32 ,33			CE04KW1C470M	ELECTRO 47UF 16WV		
C34			CE04HW1H010M	NP-ELEC 1.0UF 50WV		
C35			CC73FSL1H121J	CHIP C 120PF J		
C36			CE04HW1H2R2M	NP-ELEC 2.2UF 50WV		
C37			CE04HW1H010M	NP-ELEC 1.0UF 50WV		
C38			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C39 -41			CE04HW1E100M	NP-ELEC 10UF 25WV		
C42 ,43			CK73FB1H103K	CHIP C 0.010UF K		
C44			CE04HW1E100M	NP-ELEC 10UF 25WV		
C45 ,46			CK73FB1H103K	CHIP C 0.010UF K		
C47			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C48 ,49			CK73FB1H103K	CHIP C 0.010UF K		
C50			CK73FB1H152K	CHIP C 1500PF K		
C51			CK73FB1H473K	CHIP C 0.047UF K		
C52			CE04HW1A220M	NP-ELEC 22UF 10WV		
C53			CK73FB1H332K	CHIP C 3300PF K		
C54			CK73FB1H473K	CHIP C 0.047UF K		
C55			CE04KW0J221M	ELECTRO 220UF 6.3WV		
C56			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C57 ,58			CC73FCH1H470J	CHIP C 47PF J		
C59 ,60			CC73FSL1H270J	CHIP C 27PF J		
C61 -64			CC73FSL1H121J	CHIP C 120PF J		
C65			CK73FB1E104K	CHIP C 0.10UF K		
C66 ,67			CK73FB1H103K	CHIP C 0.010UF K		
C68 ,69			CC73FSL1H681J	CHIP C 680PF J		

L:Scandinavia K:USA P:Canada R:Mexico
Y:PX (Far East, Hawaii) T:England E:Europe G:Germany
Y:AAFES (Europe) X:Australia M:Other Areas

⚠ indicates safety critical components.

PARTS LIST

DP-M87

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❸

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Destination 仕向	Remarks 備考
C70			CK73FB1H103K	CHIP C 0.010UF K		
C71 ,72			CE04HW1E100M	NP-ELEC 10UF 25WV		
C73 ,74			CK73FB1H102K	CHIP C 1000PF K		
C75			CE04KW1A470M	ELECTRO 47UF 10WV		
C77			CK73FB1H103K	CHIP C 0.010UF K		
C78			CE04KW1V470M	ELECTRO 47UF 35WV		
C79			CE04DW1V221M	ELECTRO 220UF 35WV		
C80 ,81			CE04HW1V221M	NP-ELEC 220UF 35WV		
C82 -85			CE04KW1E221M	ELECTRO 220UF 25WV		
C86			CE04KW1C472M	ELECTRO 4700UF 16WV		
C87			CE04KW1C222M	ELECTRO 2200UF 16WV		
C88			CK73FB1H103K	CHIP C 0.010UF K		
C89			CE04KW1C222M	ELECTRO 2200UF 16WV		
C90 ,91			CK73FB1H103K	CHIP C 0.010UF K		
C92 ,93			CC73FSL1H101J	CHIP C 100PF J		
C94 ,95			CC73FSL1H221J	CHIP C 220PF J		
C96 ,97			CE04KW1A101M	ELECTRO 100UF 10WV		
C98 -101			CE04KW1C470M	ELECTRO 47UF 16WV		
C102			CC73FSL1H271J	CHIP C 270PF J		
C103,104			CK73FB1H473K	CHIP C 0.047UF K		
C105			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C106			CC73FSL1H270J	CHIP C 27PF J		
C108,109			CK73FB1H473K	CHIP C 0.047UF K		
C110			CK73FB1H103K	CHIP C 0.010UF K		
C111			CK73FB1H102K	CHIP C 1000PF K		
C113			CK73FB1H103K	CHIP C 0.010UF K		
C115			CK73FB1H103K	CHIP C 0.010UF K		
C119,120			CK73FB1H103K	CHIP C 0.010UF K		
C122-128			CK73FB1H103K	CHIP C 0.010UF K		
C130,131			CK73FB1H103K	CHIP C 0.010UF K		
J5 -7			J11-0098-05	WIRE CLAMPER		
L1			L33-0369-05	CHOKE COIL		
X1			L77-1164-05	CRYSTAL RESONATOR(16.9344MHZ)		
R82			RS14KB3D4R7J	FL-PROOF RS 4.7 J 2W		
R111			RS14KB3D101J	FL-PROOF RS 100 J 2W		
R122,123			RS14KB3D3R9J	FL-PROOF RS 3.9 J 2W		
R130			RS14KB3A5R6J	FL-PROOF RS 5.6 J 1W		
VR1			R12-1619-05	TRIMMING POT.(4.7K)		
VR2			R12-5651-05	TRIMMING POT.(100K)		
VR3 ,4			R12-3685-05	TRIMMING POT.(10K)		
W1 -3			R92-0679-05	CHIP R 0 OHM		
W10 -12			R92-0679-05	CHIP R 0 OHM		
D1 -3			MA110	DIODE		
D1 -3			1SS355	DIODE		
D4			DTZ5.1(B)	ZENER DIODE		
D5			DAN202U	DIODE		
D9 -14			MA110	DIODE		
D9 -14			1SS355	DIODE		
D15			DTZ8.2(B)	ZENER DIODE		
D16			DTZ10(B)	ZENER DIODE		
D17 -22			S5688B(TPB5)	DIODE		
D17 -22			1SR139-100(T64)	DIODE		
D23 ,24			DTZ10(B)	ZENER DIODE		

L:Scandinavia K:USA P:Canada R:Mexico
Y:PX (Far East, Hawaii) T:England E:Europe G:Germany
Y:AAFES (Europe) X:Australia M:Other Areas

⚠ indicates safety critical components.

※ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

❹

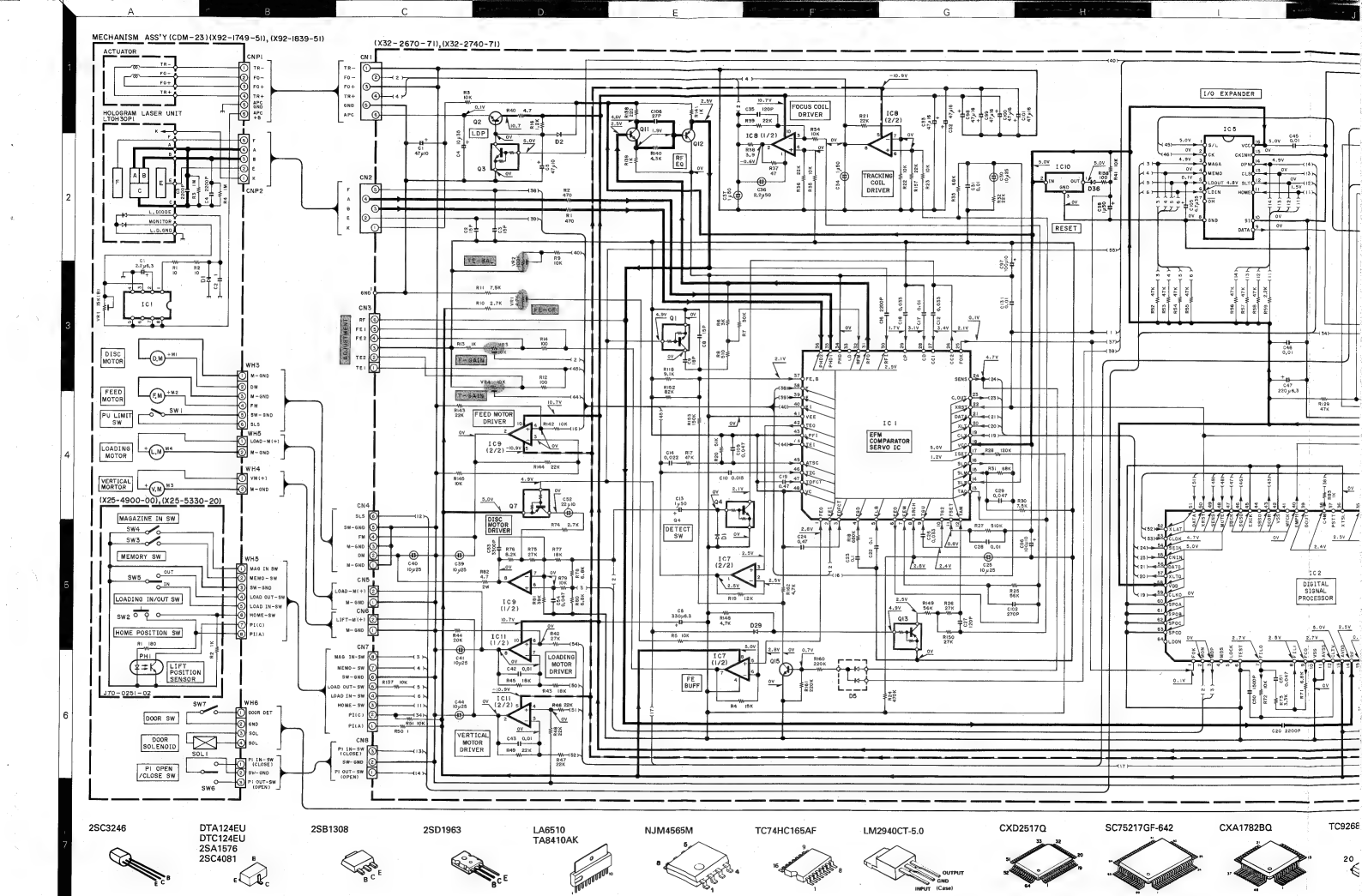
Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Destination 仕向	Remarks 備考
D25			DA204U	DIODE		
D26			S5688B(TPB5)	DIODE		
D26			1SR139-100(T64)	DIODE		
D27			DA204U	DIODE		
D28			S5688B(TPB5)	DIODE		
D28			1SR139-100(T64)	DIODE		
D29			DTZ3.9(B)	ZENER DIODE		
D30 ,31			DA204U	DIODE		
D34 ,35			DTZ5.1(B)	ZENER DIODE		
D36			MA110	DIODE		
D36			1SS355	DIODE		
D37			S5688B(TPB5)	DIODE		
D37			1SR139-100(T64)	DIODE		
IC1			CXA1782BQ	IC(SERVO AMP)		
IC2			CXD2517Q	IC(DIGITAL SIGNAL PROCESSOR)		
IC3			TC7S04F	IC(2CH NAND GATE)		
IC4			TC9268F	IC(DIGITAL FILTER)		
IC5			TC74HC165AF	IC(8BIT SHIFT REGISTER)		
IC6			SC75217GF-642	IC		
IC7			NJM2100M	IC(OP AMPLIFIER)		
IC8 ,9			LA6510	IC(DUAL POWER OP AMP)		
IC8 ,9			TA8410AK	IC(POWER OP AMP)		
IC10			S-8070AL-A4	IC(VOLTAGE DETECTOR)		
IC11			LA6510	IC(DUAL POWER OP AMP)		
IC11			TA8410AK	IC(POWER OP AMP)		
IC12,13			NJM4565M	IC(OP AMP X2)		
IC14			LM2940CT-5.0	IC(VOLTAGE REGULATOR/ +5V)		
Q1			DTC124EU	DIGITAL TRANSISTOR		
Q2			2SC3246	TRANSISTOR		
Q3 ,4			DTC124EU	DIGITAL TRANSISTOR		
Q5 ,6			2SC4081(R,S)	TRANSISTOR		
Q7			DTA124EU	DIGITAL TRANSISTOR		
Q8			2SB1308(Q,R)	TRANSISTOR		
Q9			DTA124EU	DIGITAL TRANSISTOR		
Q10			2SD1963(R,S)	TRANSISTOR		
Q11			2SC4081(R,S)	TRANSISTOR		
Q12			2SA1576(R,S)	TRANSISTOR		
Q13			DTA124EU	DIGITAL TRANSISTOR		
Q15			2SC4081(R,S)	TRANSISTOR		
			MECHANISM ASS'Y JAPAN MADE (X92-1749-51)			
1	3C		A10-3025-02	CHASSIS ASSY		
2	3D		A11-0742-12	SUB CHASSIS(RIGHT)		
3	1C		A11-0745-01	SUB CHASSIS(LEFT)		
4	1B		A11-0746-04	SUB CHASSIS CALKING ASSY		
5	1D		A11-0750-02	SUB CHASSIS(LOADING)		
6	2D		A11-0752-02	SUB CHASSIS(LOADING)		
7	1A		A11-0753-03	SUB CHASSIS		
8	3B		A11-0763-04	SUB CHASSIS CALKING ASSY		
9	1A		A11-0765-04	SUB CHASSIS CALKING ASSY		
14	3A		D10-3105-13	SLIDER		
15	2B		D10-3257-03	SLIDER		
16	1A		D10-3258-03	ARM(LOCK)		
17	2B		D10-3260-13	ARM(LOADING)		
18	1B		D10-3261-13	SLIDER(LIFT)		

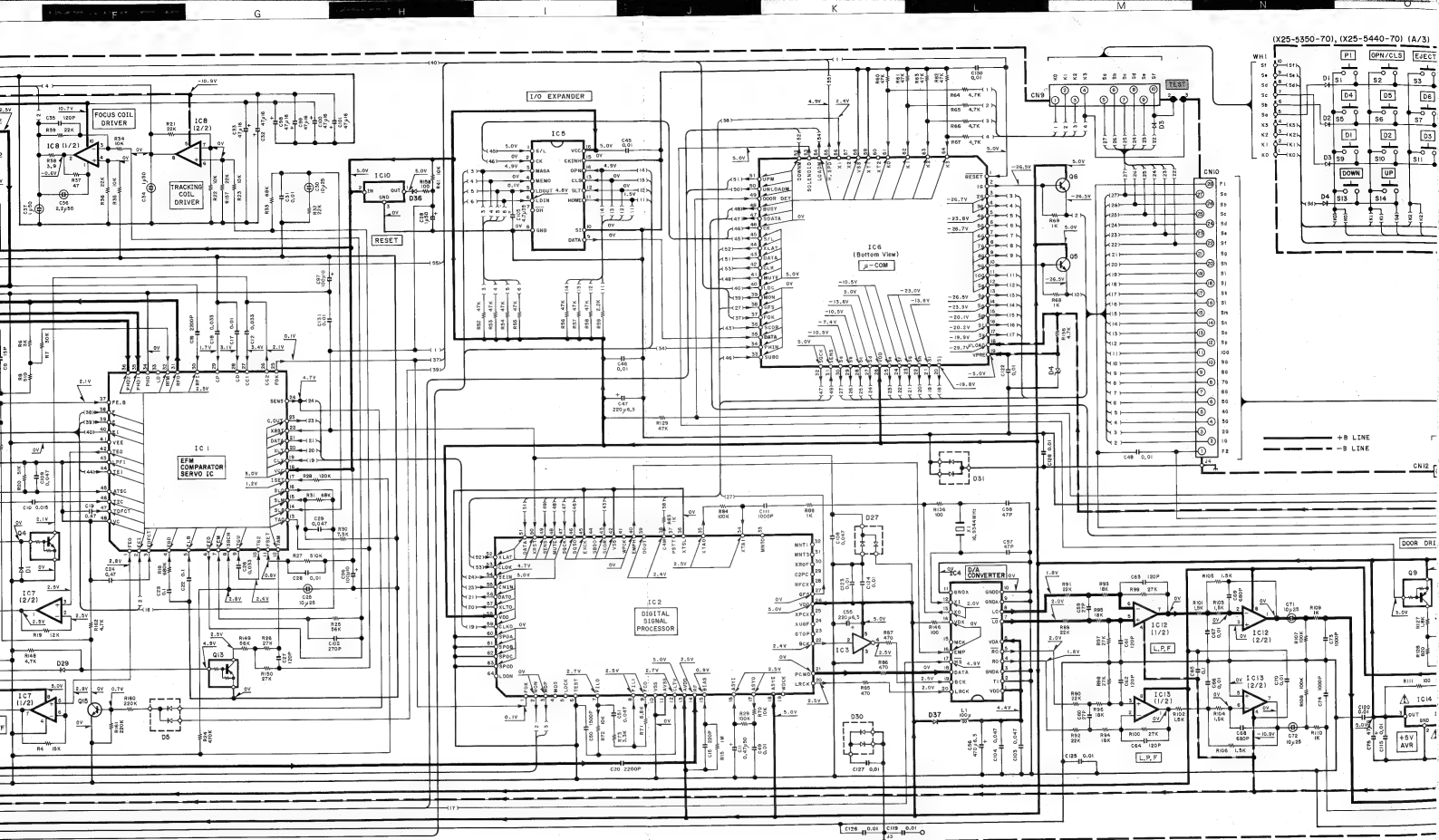
L:Scandinavia K:USA P:Canada R:Mexico
Y:PX (Far East, Hawaii) T:England E:Europe G:Germany
Y:AAFES (Europe) X:Australia M:Other Areas

⚠ indicates safety critical components.

PARTS LIST

DP-M87


MECHANISM ASS'Y (CDM-23) (X92-1749-51), (X92-1639-51)
(X32-2670-71), (X32-2740-71)
ACTUATOR
HOLOGRAM LASER UNIT (CH3OP)
CNP1
CNP2
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
DISC MOTOR
FEED MOTOR
PU LIMIT SW
LOADING MOTOR
VERTICAL MORTOR
(X25-4900-00), (X25-5330-20)
MAGAZINE IN SW
MEMORY SW
LOADING IN/OUT SW
HOME POSITION SW
LIFT POSITION SENSOR
JTO-0251-02
DOOR SW
DOOR SOLENOID
PI OPEN /CLOSE SW
WH3
WH4
WH5
WH6
SW7
SW6
SOL1
FOCUS COIL DRIVER
TRACKING COIL DRIVER
FEED MOTOR DRIVER
DISC MOTOR DRIVER
LOADING MOTOR DRIVER
VERTICAL MOTOR DRIVER
RF EQ
DETECT SW
FE BUFF
EFM COMPARATOR SERVO IC
I/O EXPANDER
DIGITAL SIGNAL PROCESSOR
RESET
2SC3246
DTA124EU
DTC124EU
2SA1576
2SC4081
2SB1308
2SD1963
LA6510
TA8410AK
NJM4565M
TC74HC165AF
LM2940CT-5.0
CXD2517Q
SC75217GF-642
CXA1782BQ
TC9266



TC74HC165AF

LM2940CT-5.0

CXD2517Q

SC75217GF-642

CXA1782BQ

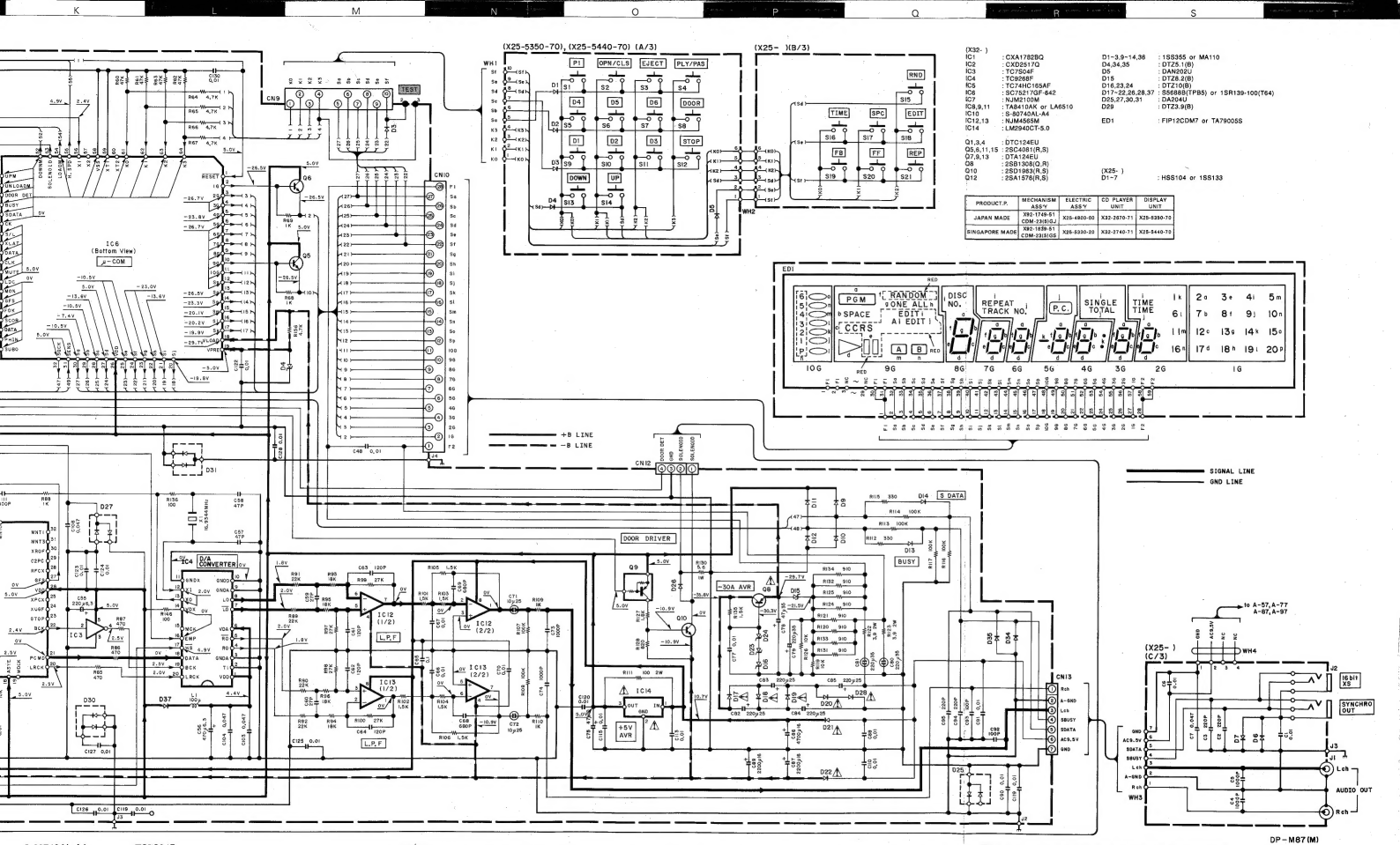
TC9268F

S-80740AL-A4

TC7S04F

- DC voltages are as measured with a high impedance voltmet or/and units.

CAUTION : For continued safety, replace safety critical co list). ⚠ Indicates safety critical components. To reduce the risk out (exposed parts are acceptably insulated from the supply cir



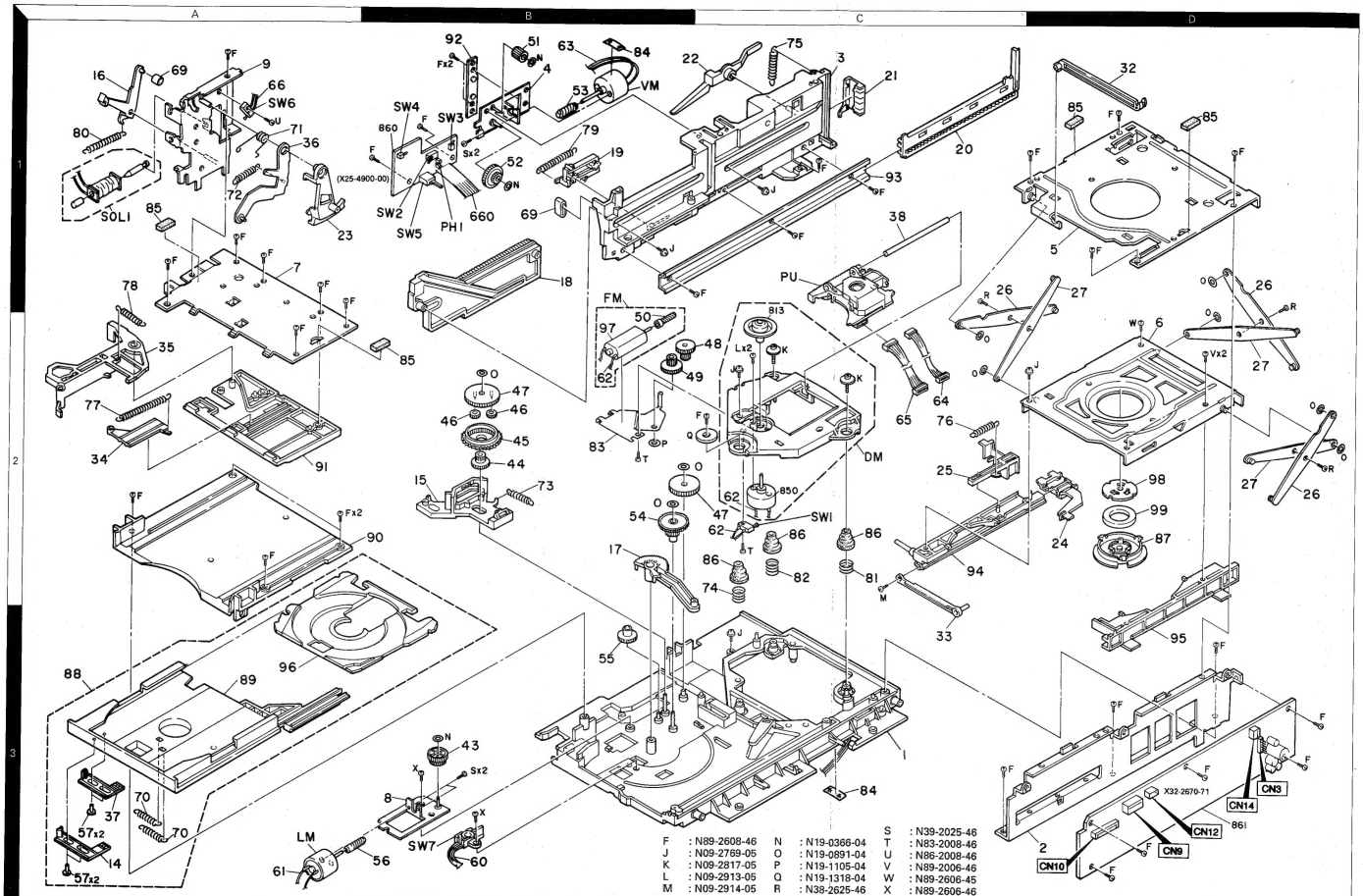
- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

CAUTION : For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

This schematic diagram is available of changing information from serial No. 31240001.

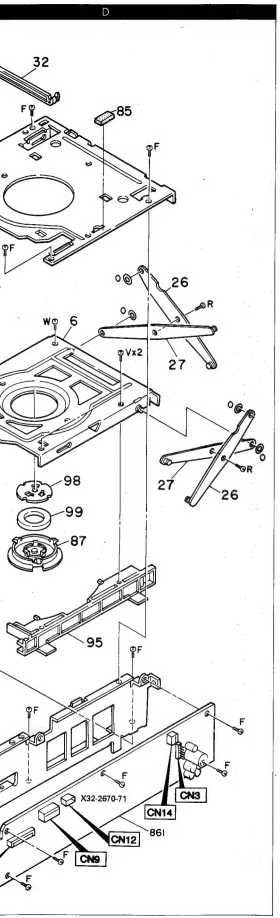
DP-M87 DP-M87

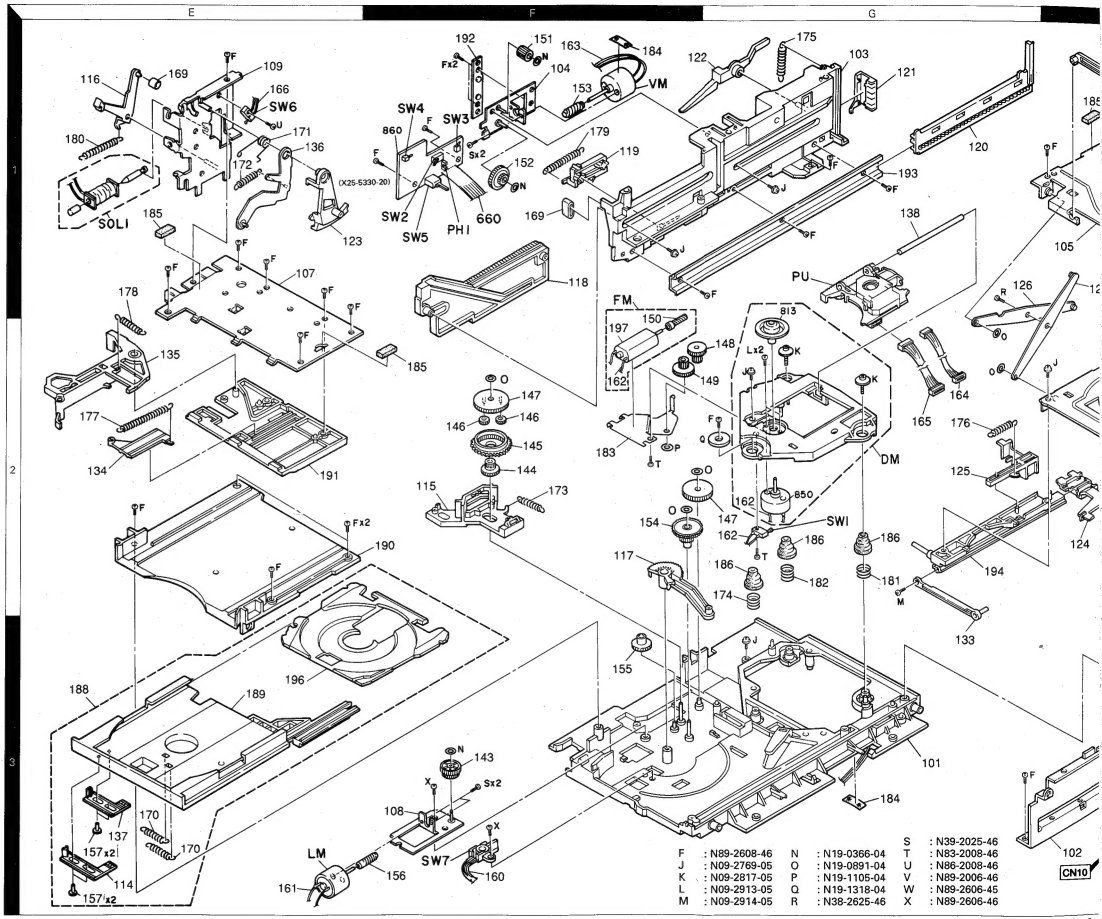
EXPLODED VIEW (MECHANISM) : JAPAN MADE



Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW (MECHANISM) : SINGAPORE MADE



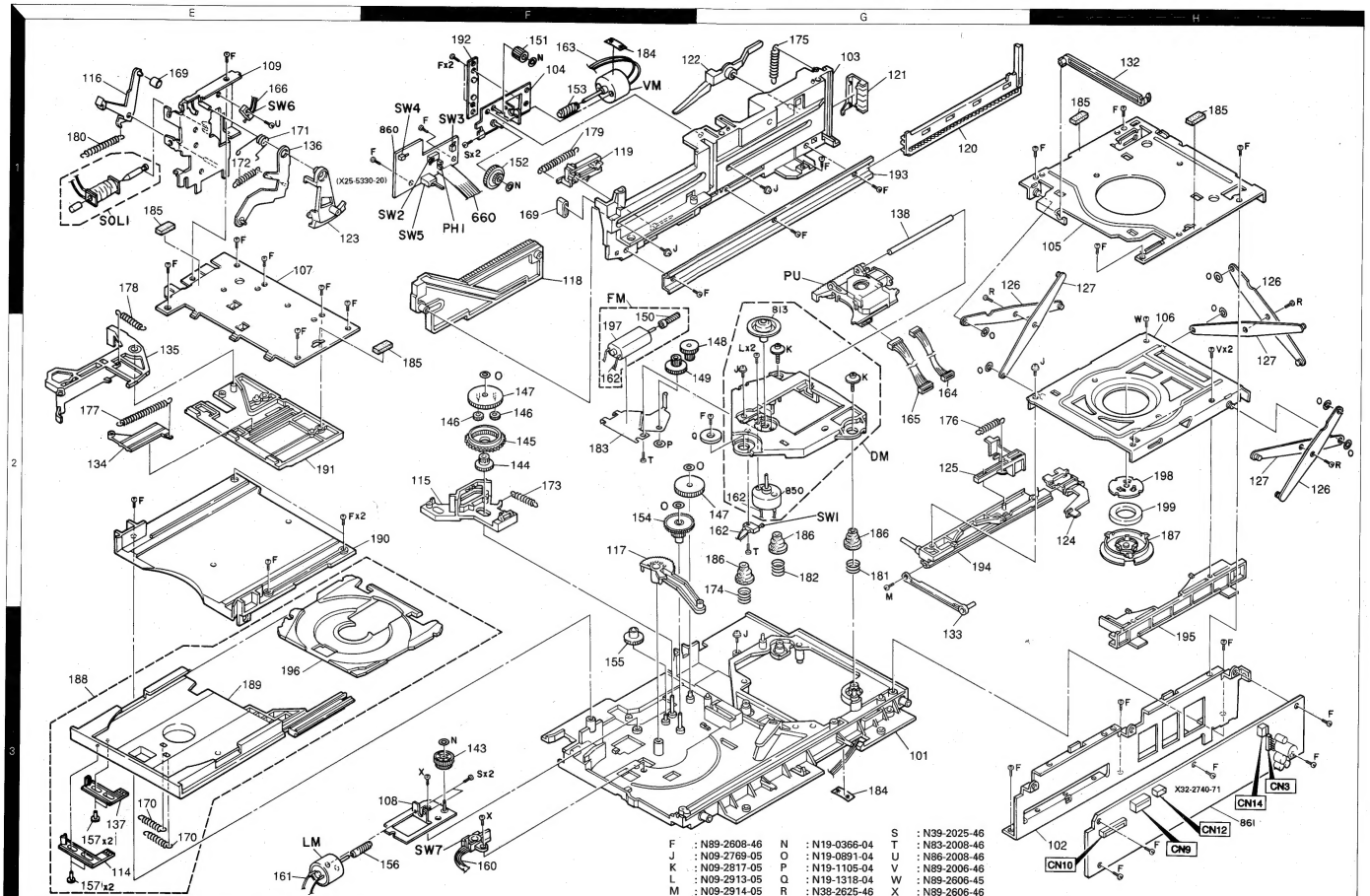


F : N89-2608-46
J : N09-2769-05
K : N09-2817-05
L : N09-2913-05
M : N09-2914-05
N : N19-0366-04
O : N19-0891-04
P : N19-1105-04
Q : N19-1318-04
R : N38-2625-46
S : N39-2025-46
T : N83-2008-46
U : N86-2008-46
V : N89-2006-46
W : N89-2606-45
X : N89-2606-46

l numbers larger than 700 are not supplied.

Parts with the explode

EXPLODED VIEW (MECHANISM) : SINGAPORE MADE



F	: N89-2608-46	N	: N19-0366-04	S	: N39-2025-46
J	: N09-2769-05	O	: N19-0891-04	T	: N83-2008-46
K	: N09-2817-05	P	: N19-1104-04	U	: N86-2008-46
L	: N09-2913-05	Q	: N19-1318-04	V	: N89-2006-46
M	: N09-2914-05	R	: N38-2625-46	W	: N89-2606-45
				X	: N89-2606-46

Parts with the exploded numbers larger than 700 are not supplied.